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Upon lifting the foot, the opposite actions will occur, releasing energy in an upward and forward direction, and thereby both lifting and propelling the foot.

#### BACKGROUND OF THE INVENTION

The present invention relates to a novel contact surface and support structure for a shoe. Shoes are almost universal apparel, worn for both appearance and function. This varies from walking, running, jumping, etc. and are used by both athletes and amputees. This invention seeks to enhance and complement the normal structure and function of the foot, rather than merely surround it in a box.

The human foot is a dynamic structure intended to contact the ground at predominantly two areas- the heel (talo-calcaneous) and the metatarsal-phalangeal

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joints (MT) and metatarsal heads. These structures are strongly formed and well supported by ligaments, tendons, and connective tissue. In contrast the toes (phalanges) and metatarsals (M) are lightweight, and weakly formed and protected. They are easily bruised, sprained, and broken.

A traditional shoe provides some arch support, but transmits force to both the toes and metatarsal areas in a crushing manner. The submitted invention prevents, or minimizes, this injury by minimizing contact with the toes and M areas, and instead transmitting all force to sturdy areas. This is accomplished through contact pads located over the heel and metatarsal heads/ MT areas. Stress on the foot is also minimized by the pad compressibility and

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mattress, in addition to the coiling of the skeleton.

Because of the form of the skeleton, consisting of two independent portions inserting separately and at different points into the compressible pads, the energy captured on downward contact gives a lift and forward thrust upon lifting the foot, with the MT essentially action as a fulcrum.

The presented invention would be a notable advance in the field, enhancing comfort and athletic performance while minimizing injury.

#### SUMMARY OF THE INVENTION

The inventor of the above shoe is a physician with a public health group and a marathon runner. Dr. Held has personally experienced the frustrations of currently available shoes, providing health care to many patients with foot and leg problems, diabetes, obesity, circulatory and neurological problems.

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This novel shoe design is lighter in weight than the traditional, and also less expensive. The compressible rubber cushions are replaceable, thereby creating 'reusable shoes.' Replacement should rarely be needed, as the underlying contact surface of the cushions is very sturdy. The contact cushions can be scored or imprinted on the bottom, maximizing traction or other functions. The cushions are screwed into the above skeleton, or possibly snapped with female and male portions, emphasizing reusability. The form of the cushions may vary to serve different functions- as tennis, basketball, running, walking. etc.

The skeleton is structured of either polyethylene, lightweight metal, plastic, polyvinyl, composite, etc. Its form is perforated in the center, or potentially

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could be constructed in a 'rebar' type structure. This structure will be durable, but also allows bendability in the center to maximize comfort and efficiency.

The invention allows great variety of the 'foot cover', providing both comfort and attractive design.

The invention can be personalized to an individual's foot structure or needs and pressure points through creating a unique set of cushions, skeleton, and overlying mattress.

The invention possesses other objects and advantages, especially as concerns particular characteristics and features thereof which will become apparent as review and specification continues.

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BRIEF DESCRIPTION OF THE SEVERAL VIEWS  
OF THE DRAWING

Fig. 1 is a side view of the invention.

Fig. 2 is a view from below the shoe.

Fig. 3 is a view from above (or below) one layer of  
the mattress.

Fig. 4 is a view from below the back portion of the  
skeleton.

Fig. 5 is a view from below the front part of the  
skeleton.

Fig. 6 is a side view of the contact cushion

*July 17/1911*

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DETAILED DESCRIPTION OF THE PREFERRED  
EMBODIMENTS OF INVENTION

Various aspects of the invention will evolve from the following detailed description of the preferred embodiments thereof, which should be referenced to the prior described drawings. This is especially expected to occur if this novel invention is adapted to mass production.

*July 17, 1968*